

IN THE CLAIMS:

The following listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Currently Amended) A ~~carrier computer-readable memory~~ medium comprising ~~storing~~ program instructions executable to implement ~~the a method of comprising:~~

determining an ordering for a plurality of N nodes such that the nodes are circularly ordered as nodes D₀, D₁, D₂, ... D_{N-1};

each node D_i in the plurality of nodes establishing a link to X other nodes chosen as nodes D_{i+1}, D_{i+2}, ... D_{i+X}, wrapping to D₀ if necessary; and

each node D_j in at least a subset of the plurality of nodes establishing a link with one or more additional chosen nodes not in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X}; and

for each node D_j in the at least the subset, each node in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X} establishing a link with the one or more additional nodes chosen by the node D_j.

2. (Canceled)

3. (Currently Amended) The ~~carrier computer-readable memory~~ medium of claim 1, wherein said each node D_j in the at least the subset establishing a link with one or more additional chosen nodes not in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X} comprises each node D_j in the at least the subset establishing a link with one or more randomly chosen nodes not in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X}.

4. (Currently Amended) The carrier computer-readable memory medium of claim 3, wherein said each node D_j in the at least the subset establishing a link with one or more randomly chosen nodes comprises each node D_j in the at least the subset establishing a link with exactly one randomly chosen node.
5. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the plurality of nodes utilize the established links to communicate in a peer-to-peer manner.
6. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the nodes are circularly ordered so that node D_{N-1} follows node D_0 in the ordering.
7. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the method implemented by the program instructions further comprises:
selecting the nodes for the at least the subset of the plurality of nodes such that
wherein the at least the subset includes nodes whose position in the ordering is a multiple
of $2X$.
8. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein X is substantially at least eighty percent smaller than N .
9. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein each node in the plurality of nodes has a unique node ID; wherein said determining the ordering comprises determining an ordering based on the node IDs.
10. (Currently Amended) The carrier computer-readable memory medium of claim 9, wherein the node IDs are capable of being ordered; wherein said determining the ordering based on the node IDs comprises ordering the node IDs;

wherein the node with the first node ID in the ordering is selected as node D₀, wherein the node with the second node ID in the ordering is selected as node D₁, and so on, up to the node with the highest node ID in the ordering being selected as node D_{N-1}.

11. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein each link between two nodes comprises a virtual communication channel between the two nodes.
12. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the established links comprise one or more TCP links and/or one or more UDP links.
13. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the plurality of nodes are interconnected in a local area network (LAN).
14. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the method implemented by the program instructions further comprises:
one or more nodes in the plurality of nodes establishing one or more additional links to one or more other nodes.
15. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the established links enable a message to be routed from any given first node to any given second node with an average efficiency on the order of log(N) message hops.
16. (Currently Amended) The carrier computer-readable memory medium of claim 1, wherein the established links enable recovery operations to be performed in the event of node failures with an average efficiency on the order of 3 message hops or less.

17. (Currently Amended) A carrier computer-readable memory medium comprising storing program instructions executable to implement the a method of comprising:

determining an ordering for a plurality of N nodes such that the nodes are circularly ordered as nodes D₀, D₁, D₂, ... D_{N-1};

each node D_i in the plurality of nodes establishing a link to X other nodes chosen as D_{i+1}, D_{i+2}, ... D_{i+X}, wrapping to D₀ if necessary; and

for each node D_j in at least a subset of the plurality of nodes:

the node D_j establishing a link with one or more randomly chosen nodes not in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X};

each node in the set D_{j-X}, D_{j-X+1}, ... D_{j-1}, D_{j+1}, D_{j+2}, ... D_{j+X} establishing a link with the one or more nodes randomly chosen by the node D_j.

18. (Currently Amended) A carrier computer-readable memory medium comprising storing program instructions executable to implement the a method of comprising:

determining an ordering for a plurality of nodes such that the ordering has a first node, a second node, and so on, up to a last node, wherein the ordering is circular so that the first node follows the last node in the ordering;

each node establishing one or more links to one or more nodes immediately following the node in the ordering; and

for each respective node of at least a subset of the plurality of nodes, each the respective node in the subset establishing one or more links to one or more randomly chosen nodes and each of the one or more nodes immediately following the respective node also establishing a link to each of the one or more nodes randomly chosen by the respective node.

19. (Currently Amended) A system comprising:

a network;

a plurality of N nodes; coupled via the network;

wherein each node is operable to determine an ordering for the plurality of N nodes such that the nodes are circularly ordered as nodes D₀, D₁, D₂, ... D_{N-1};

wherein each node D_i in the plurality of nodes is operable to establish a link to X other nodes chosen as nodes $D_{i+1}, D_{i+2}, \dots D_{i+X}$, wrapping to D_0 if necessary; and

wherein each node D_j in at least a subset of the plurality of nodes is operable to establish a link with one or more additional chosen nodes not in the set $D_{j-X}, D_{j-X+1}, \dots D_{j-1}, D_{j+1}, D_{j+2}, \dots D_{j+X}$; and

wherein for each node D_j in the at least the subset, each node in the set $D_{j-X}, D_{j-X+1}, \dots D_{j-1}, D_{j+1}, D_{j+2}, \dots D_{j+X}$ is operable to establish a link with the one or more additional nodes chosen by the node D_j .

20. (Canceled)

21. (Original) The system of claim 19,

wherein said each node D_j in the at least the subset establishing a link with one or more additional chosen nodes not in the set $D_{j-X}, D_{j-X+1}, \dots D_{j-1}, D_{j+1}, D_{j+2}, \dots D_{j+X}$ comprises each node D_j in the at least the subset establishing a link with one or more randomly chosen nodes not in the set $D_{j-X}, D_{j-X+1}, \dots D_{j-1}, D_{j+1}, D_{j+2}, \dots D_{j+X}$.

22. (Original) The system of claim 21,

wherein said each node D_j in the at least the subset establishing a link with one or more randomly chosen nodes comprises each node D_j in the at least the subset establishing a link with exactly one randomly chosen node.

23. (Original) The system of claim 19,

wherein the plurality of nodes are operable to utilize the established links to communicate in a peer-to-peer manner.

24. (Original) The system of claim 19,

wherein the at least the subset includes nodes whose position in the ordering is a multiple of 2X.

25. (Currently Amended) The system of claim 19,
wherein X is substantially at least eighty percent smaller than N.
26. (Original) The system of claim 19,
wherein each node in the plurality of nodes has a unique node ID;
wherein said determining the ordering comprises determining an ordering based
on the node IDs.
27. (Original) The system of claim 19,
wherein each link between two nodes comprises a virtual communication channel
between the two nodes.
28. (Original) The system of claim 19,
wherein the network comprises a local area network (LAN), wherein the LAN
interconnects the plurality of nodes.
29. (Original) The system of claim 19,
wherein one or more nodes in the plurality of nodes are operable to establish one
or more additional links to one or more other nodes.